

Claims: We claim:

1. A method for altering a selected property of a body fluid comprising the steps of:
inserting an exchange catheter into a body cavity so that a surface of the catheter is in contact with a body fluid;
providing a working fluid within said catheter conditioned to alter said body fluid property by means of interaction between said fluids through said surface;
and
applying pulsating energy through a source external to said cavity to said catheter surface for increasing interaction between said fluids.
2. A method according to claim 1 wherein said energy applying step comprises inducing pressure pulses in said working fluid.
3. A method according to claim 1 wherein said pulsating energy applying step comprise circulating said working fluid through said catheter and cyclically reversing the direction of circulation of said fluid
4. A method according to claim 1 wherein said pulsating energy induces oscillations in portions of said surface for transferring energy to said body fluid for reducing boundary layer thicknesses between said body fluid and said surface.

5. A system for altering a body fluid comprising :
an exchange catheter for insertion into a body cavity so that a surface of said catheter is in contact with said body fluid;
a control system for circulating a working fluid through said catheter and into contact with said surface and for conditioning said working fluid for altering said body fluid by means of interaction between said working fluid and said body fluid through said surface; and said control system including means for transferring pulsating energy to said catheter surface for increasing the interaction between said fluids.
6. A system according to claim 5 wherein said surface is the outside surface of a wall of an elongated tube through which said working fluid is circulated, said wall have spaced apart portion of high compliance and said transferring means comprises means for inducing pressure pulses in said circulating fluid causing surface undulations of said high compliance portions for transferring energy to said body fluid.
7. A system according to claim 5 wherein said surface is the outside surface of an elongated balloon, and said energy transferring means comprises means for inducing pressure pulses in said circulating fluid for cyclically inflating and deflating said balloon for inducing mixing in said body fluid.
8. A system according to claim 5 wherein a portion of said exchange surface enables interconnection between said exchange catheter with distal protection filters for alignment of said exchange catheter within said body cavity

9. A system according to claim 5 wherein a portion of said exchange surface enables variable rates of said working fluid infusion for rapid cooling of said body fluid.
10. A system according to claim 7 including a plurality of tubes disposed in adjacent parallel relation to said balloon, each of said tubes having an outside surface in contact with said body fluid for interaction with working fluids circulating through said tubes and interaction between said body fluid and working fluids within said tubes being increased by the balloon induced mixing of said body fluid.
11. A system according to claim 5 wherein said catheter comprises a plurality of parallel hollow tubes arranged in a bundle disposed between first and second manifolds at opposite ends of said bundle, and transfer means for conveying a working fluid from said control system to said first manifold for flow of said fluid through all of said tubes to said second manifold through said transfer means back to said control system
12. A system according to claim 9 including turbine disposed in the flow path of said working fluid at one of said manifolds for causing rotation of said tube bundle.

13. A system according to claim 9 wherein portions of said catheter surfaces in contact with said body fluid are porous for infusion of substances carried by said working fluid into said body fluid.